Overview and Introduction of Augustine Committee Findings

In May, 2009 Dr. John Holdren, Director of the Office of Science and Technology Policy, asked the National Aeronautics and Space Administration (NASA) to initiate an independent review of its human space flight programs and plans. Led by former Lockheed Martin executive Norman Augustine, the Review of U.S. Human Spaceflight Plans Committee (the Augustine Committee) was chartered to identify and characterize a range of options for continuation of U.S. human space flight activities beyond retirement of the Space Shuttle. A key goal for this review was to help ensure that these activities and programs remain on a strong and stable footing well into the 21st century. The Augustine Committee was comprised of an exceptional group of ten experts offering diverse experience in the U.S. government, military, and industry, and in the human space flight sector in particular.

The Committee has conducted an objective and comprehensive assessment and has found that the U.S. human space flight program appears to be on an unsustainable trajectory. Independent analysis conducted for the Committee determined that the proposed Ares I crew launch vehicle and Orion crew capsule (each part of NASA's plans for carrying astronauts to space in the future) would not become fully operational until at least 2017. However, this assumed that the International Space Station would be retired from service in 2016 – thus giving no immediate destination for the Ares I and Orion vehicles once they became available. Even with an unconstrained budget, the Committee determined that the Ares I and Orion would likely be available no earlier than 2016. Further, to enable astronauts to return to the Moon by the early 2020s, NASA would need at least $50 billion in additional funds, reflecting significant increases and schedule delays relative to initial estimates.

Against this backdrop of challenges, the Augustine Committee has offered several key findings and options for how the nation might improve its future human space flight activities. The Committee members should be commended for their efforts and service to the nation.

Excerpts of Key Findings from the Executive Summary

The right mission and the right size: NASA's budget should match its mission and goals. Further, NASA should be given the ability to shape its organization and infrastructure accordingly, while maintaining facilities deemed to be of national importance.

International partnerships: The U.S. can lead a bold new international effort in the human exploration of space. If international partners are actively engaged, including on the "critical path" to success, there could be substantial benefits to foreign relations and more overall resources could become available to the human spaceflight program.

Short-term Space Shuttle planning: The remaining Shuttle manifest should be flown in a safe and prudent manner without undue schedule pressure. This manifest will

likely extend operation into the second quarter of FY 2011. It is important to budget for this likelihood.

The human-spaceflight gap: Under current conditions, the gap in U.S. ability to launch astronauts into space will stretch to at least seven years. The Committee did not identify any credible approach employing new capabilities that could shorten the gap to less than six years.

Extending the International Space Station: The return on investment to both the United States and our international partners would be significantly enhanced by an extension of the life of the ISS. A decision not to extend its operation would significantly impair U.S. ability to develop and lead future international spaceflight partnerships.

Heavy lift: A heavy-lift launch capability to low-Earth orbit, combined with the ability to inject heavy payloads away from the Earth, is beneficial to exploration. It will also be useful to the national security space and scientific communities.

Commercial launch of crew to low-Earth orbit: Commercial services to deliver crew to low-Earth orbit are within reach. While this presents some risk, it could provide an earlier capability at lower initial and life-cycle costs than government could achieve. A new competition with adequate incentives to perform this service should be open to all U.S. aerospace companies. This would allow NASA to focus on more challenging roles, including human exploration beyond low-Earth orbit based on the continued development of the current or modified Orion spacecraft.

Technology development for exploration and commercial space: Investment in a well-designed and adequately funded space technology program is critical to enable progress in exploration. Exploration strategies can proceed more readily and economically if the requisite technology has been developed in advance. This investment will also benefit robotic exploration, the U.S. commercial space industry, the academic community and other U.S. government users.

Pathways to Mars: Mars is the ultimate destination for human exploration of the inner solar system; but it is not the best first destination. Visiting the "Moon First" and following the "Flexible Path" are both viable exploration strategies.

Options for the human spaceflight program: The Committee developed five alternatives for the Human Spaceflight Program. It found:

- Human exploration beyond low-Earth orbit is not viable under the FY 2010 budget guideline.
- Meaningful human exploration is possible under a less constrained budget, increasing annual expenditures by approximately $3 billion in real purchasing power above the FY 2010 guidance.
- Funding at the increased level would allow either an exploration program to explore the Moon First or one that follows the Flexible Path. Either could produce significant results in a reasonable timeframe.